VPX-REDI
(OpenVPX)

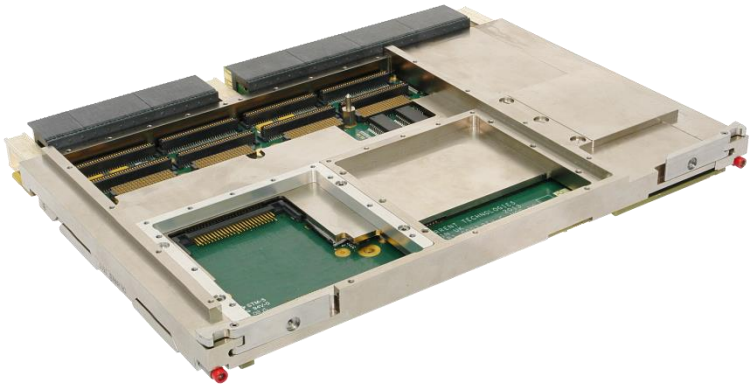
VR E1x/msd-RCx
RCS, RCT - Series

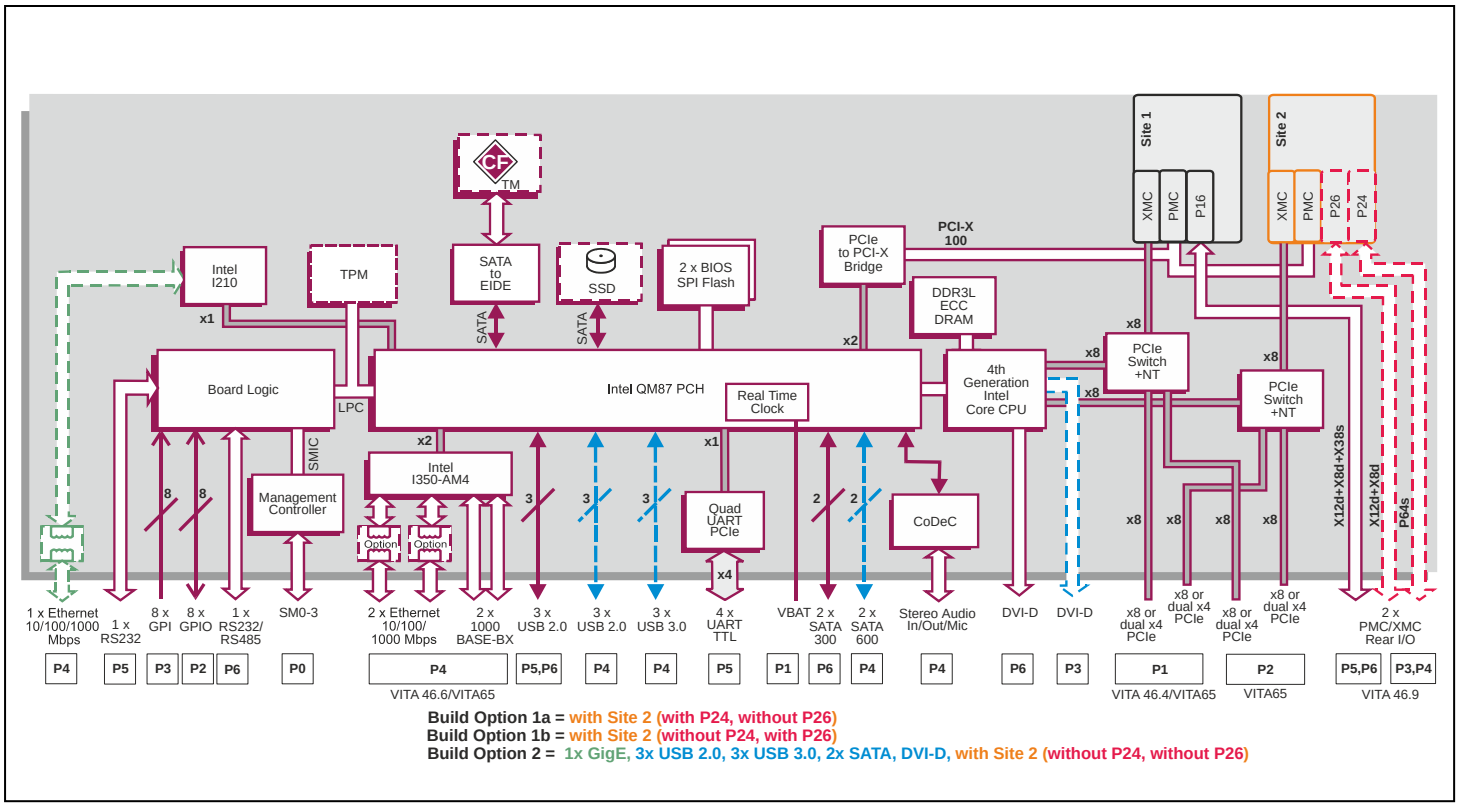
Rugged Conduction-Cooled 6U VPX-REDI board based on 4th Generation Intel® Core™ Processor

Key Features

VR E1x/msd-RCx is a rugged conduction-cooled 6U VPX processor board for use in defense, industrial, scientific and aerospace markets:

- Based on a quad-core processor to match application performance and power requirements
- Up to 32 Gbytes DRAM with built in error correction for reliable operation
- Configurable fabric connections to match several OpenVPX™ profiles
- Dual PMC/XMC sites for local expansion
- On board solid state disk options for operating system, application and data use
- Optional Built-In-Test and security packages





Build Option 1a = with Site 2 (with P24, without P26)
Build Option 1b = with Site 2 (without P24, with P26)
Build Option 2 = 1x GigE, 3x USB 2.0, 3x USB 3.0, 2x SATA, DVI-D, with Site 2 (without P24, without P26)

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Specification

VPX-REDI Processor Board

- 6U VPX-REDI conduction-cooled processor board utilizing the 4th generation Intel® Core™ processor
- two rear I/O factory build options:
  - → option 1 - legacy VR 737/x8x compatible I/O
  - → option 2 - dual PMC/XMC sites plus extra I/O
- compatible with several OpenVPX module profiles
- for non-rugged VPX versions:
  - → commercial air-cooled
  - → see VR E1x/msd datasheet

Central Processor

- 4th generation Intel® Core™ processor:
  - → 4-core Intel® Core™ i7-4700EQ processor up to 2.4 GHz, 6M Last Level cache
  - → Intel® Advanced Vector Extensions 2 (AVX2)
  - → Intel® AES New Instructions (AES-NI)
- utilizes the Intel® QM87 Platform Controller Hub
- 16 or 32 Gbytes soldered DDR3L-1600 ECC DRAM:
  - → single bit error correction, dual channel memory
  - → accessible from processor or VPX fabric

PMC/XMC Interfaces (build options)

- both PMC/XMC sites commonly support:
  - → PMC 32/64-bit, shared 33/66/100MHz PCI/PCI-X bus (3.3V PCI signaling, 5V tolerant)
  - → PMC VIO from 3.3V or 5V (user selectable switch)
  - → XMC - 1 x8, 2 x4 PCI Express® (PCIe) Gen 2
  - → XMC VPWR from 5V or 12V (build option)
  - → VITA 46.9 compliant pin-out
- build option 1 - dual sites, VR 737/x8x compatible:
  - → site 1 XMC P16, supporting 20 differential-pairs plus 38 single-ended, X12d+X8d+X38s
  - → build option 1a - site 2 PMC P24, supporting 64 single-ended, P64s
  - → build option 1b - site 2 XMC P26 supporting 20 differential-pairs, X12d+X8d
- build option 2 - dual sites, site 1 has rear I/O:
  - → site 1 XMC P16, supporting 20 differential-pairs plus 38 single-ended, X12d+X8d+X38s
  - → site 2 without XMC P26, without PMC P24

Graphics Interfaces

- up to two independent graphics interfaces:
  - → each supporting up to 1920 x 1200
- DVI-D via P6
- build option 2 - DVI-D via P3

Stereo Audio

- Intel® High Definition Analog Audio interface (on-board CoDec) via P4 (build option):
  - → stereo line input, line output and microphone

Mass Storage Interfaces

- for all build options (unless otherwise stated)
- support for on-board CompactFlash® socket
- optional on-board 2.5-inch SATA600 drive
- 2 x SATA300 interfaces via P6
- build option 2 additionally includes 2 x SATA600 interfaces via P4

Serial Interfaces

- for both build options
- 1 x RS232 channel via P5
- 1 x RS232/422/485 channel via P6:
  - → supporting full modem in RS232 only
  - → supporting Transmit Control in RS485 mode
- 4 x UART serial TTL interfaces via P5
- 16550 compatible UARTs

Other Peripheral Devices

- for both build options (unless otherwise stated)long duration timer and watchdog timer
- PC Real Time Clock
- CPU temperature, board temperature and voltage sensors accessed via System Management interface
- 8 x GPIO signals via P2, 8 x GPI signals via P3
- 3 x USB 2.0 ports, two via P6 and one via P5
- build option 2 additionally includes 3 x USB 2.0 and 3 x USB 3.0 interfaces via P4

VPX Data/Expansion Plane PCIe Interface

- configurable PCIe fabric interfaces (VITA 46.4, VITA 65), each fabric supporting:
  - → 2 x8 or 4 x4 PCIe (Gen 1, Gen 2, and Gen 3)
  - → compatible with OpenVPX™ module profiles
- supports up to two non-transparent ports with DMA for multi-processing applications
- PCIe ports can be configured by the VPX switch configuration tool

VPX Control Plane Ethernet Interfaces

- 2 x 10/100/1000 Mbps Ethernet interfaces via P4:
  - → with or without magnetics (build option)
- 2 x 1000BASE-BX interfaces via P4
- VITA 46.6, VITA 65 compliant

Additional Ethernet Port (build option)

- build option 2 - additional 1 x 10/100/1000 Mbps Ethernet port (with on-board magnetics) via P4

Non-Volatile Memory

- dual 8 Mbytes of BIOS SPI Flash EPROM
- 8 Kbytes User EEPROM

Software Support

- support for Linux®, Windows® and VxWorks®

Firmware Support

- Insyde Software InsydeH20™ BIOS
- optional Fast Boot solution using Intel Firmware Support Package (Intel® FSP)
- Intel® Platform Innovation Framework for EFI
- LAN boot firmware included

Optional Built-In Test (BIT) Support

- Power-on BIT (PBIT), Initiated BIT (IBIT), Continuous BIT (CBIT)

Optional Board Security Features

- Trusted Platform Module (TPM):
  - → build option for either TPM 1.2 or TPM 2.0
- option for Sanitization Utility Software Package
- proprietary board-level security features

Safety

- PCB (PWB) manufactured with flammability rating of UL94V-0

System Management

- System Management interface:
  - → implements SM0-1 and SM2-3 hardware
- on-board System Management Controller

Electrical Specification

- typical current figure for 4-core processor (2.4 GHz) with 16 Gbytes DRAM:
  - → VS3, +5V @ 10.0A, voltage +5%/-2.5%
- 3V3_AUX @ 600mA maximum, voltage +5%/-2%

Environmental Specification

- operating temperature (at card edge):
  - → VITA 47 Class CC4, -40°C to +85°C
  - → conduction-cooled (VITA 48.2)
  - → card edge temperature is affected by processor load and XMC card population
- non-operating temperature:
  - → VITA 47 Class C4, -55°C to +105°C
- operating altitude:
  - → -1,000 to 50,000 feet (-305 to 15,240 meters)
- 5% to 95% Relative Humidity, non-condensing

Mechanical Specification

- 6U VPX form-factor (VITA 46.0) 9.2 inches x 6.3 inches (233mm x 160mm)
- slot widths (VITA 48.0):
  - → 0.8 inches VPX-REDI Type 2, RCT-Series
  - → 0.85 inches VPX-REDI Type 1, RCS-Series, Type 1 Two Level Maintenance (VITA 48.2)
- connectors to VITA 46.0 for P0 through P6
- operating mechanical:
  - → shock - VITA 47 Class OS2, 40g
  - → random vibration - VITA 47 Class V3, 0.1g²/Hz

Please contact your local Concurrent Technologies sales office for further details on board build options and accessories.

Datasheet Code 1726/0719